



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,545	08/31/2001	Donald R. Mullen	1726.7221000	3037

25697 7590 09/24/2003

ROSS D. SNYDER & ASSOCIATES, INC.
115 WILD BASIN RD.
SUITE 107
AUSTIN, TX 78746

EXAMINER

OWENS, DOUGLAS W

ART UNIT PAPER NUMBER

2811

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,545

Applicant(s)

MULLEN ET AL.

Examiner

Douglas W Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 7-13, 20, 21, 25, 27, 34 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-19, 22-24, 26, 28-32 and 36-41 is/are rejected.
- 7) ☒ Claim(s) 14 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 28 – 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 recites the limitation, "...wherein the plate portion is formed in a pre-loaded shape...". The scope of the claim is vague since it is not known what the term "pre-loaded shape" encompasses.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 16-19, 31-32 and 36-40 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent No. 5,783,461 to Hembree.

Regarding claim 1, Hembree teaches an IC cover (Figs. 1 & 2) comprising:

a plate portion (20, 24);

an attachment portion (under spring portion (22)); and

a spring portion coupled to the plate portion and the attachment portion.

Art Unit: 2811

Regarding claim 16, Hembree teaches an IC cover, wherein the spring portion includes a plurality of individual spring elements, wherein a first one of the plurality of individual spring elements is disposed at a first end of the plate portion and a second one of the plurality of individual spring elements is disposed at a second end of the plate portion.

Regarding claims 17 and 19, Hembree teaches an IC cover, wherein the spring elements are disposed around a perimeter of the plate portion.

Regarding claim 18, Hembree teaches an IC cover, wherein at least one of the spring elements is maintained in a non-relaxed state.

Regarding claim 31, Hembree teaches an IC assembly (Fig. 2) comprising:

- a circuit board (16);

- a first die (12) disposed on a first surface of the circuit board; and

- a cover including:

 - a plate portion (20, 24) disposed so as to cover the first die;

 - an attachment portion (directly under spring (22) and spring (26)) attached to the circuit board; and

 - a spring portion (22, 26) coupled to the plate portion and the attachment portion.

Regarding claim 32, Hembree teaches an assembly, wherein the spring portion exerts pressure between the plate portion and the first die.

Regarding claim 36, Hembree teaches an IC cover comprising:

- a plate portion (24) having a plurality of edges;

Art Unit: 2811

a plurality of attachment portions (located under spring (22)); and
a plurality of spring portions coupled to the plate portion and attachment portions, wherein the springs are oriented along a direction corresponding to the plurality of edges.

Regarding claim 37, Hembree teaches an IC cover, wherein center lines of the springs are oriented so as to be non-radial relative to a centroid of the plate portion.

Regarding claim 38, Hembree teaches an IC cover, wherein each of center lines of the spring portions are oriented approximately tangentially in relation to a corresponding one of the plurality of edges.

Regarding claim 39, Hembree teaches an IC cover, wherein the spring portions are oriented in a similar rotational direction with respect to a centroid of the plate portion.

Regarding claim 40, Hembree teaches an IC cover, wherein the plurality of spring portions are configured to cooperatively accommodate displacement of the plate portion from a relaxed position.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2811

6. Claims 2 – 6, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of US patent application publication No. 2002/0079571 to Takeuchi et al.

Regarding claims 2 and 26, Hembree does not teach an IC cover that is unitarily molded of a polymer material. Takeuchi et al. teaches an IC cover, that is unitarily molded of a polymer material (section [0020] third and fifth sentence). It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi et al. into the device taught by Hembree, since the polymer material is a known material that is well suited for the intended use. The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Hembree does not explicitly teach that the spring portion is a polymer material. Hembree teaches that the spring portion can be formed of an elastomeric material. It would have been obvious to select a polymer material since it is a known material that is well suited for the intended use.

Regarding claim 3, neither Hembree nor Takeuchi et al. teach an IC, wherein cover, wherein the polymer material has a thermal conductivity of at least 10 watts/meter. Takeuchi et al. teaches that it is desirable to remove excess heat from integrated circuits, as is known in the art. It would have been obvious to one of ordinary skill in the art to provide a polymer material having good thermal conductivity, since it is desirable to remove heat from the IC.

Art Unit: 2811

Regarding claim 4, Hembree does not teach an IC cover, further comprising a heat sink coupled to the plate. Takeuchi et al. teaches an IC, wherein a heat sink is coupled to the plate. It would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Takeuchi et al. into the device taught by Hembree, since it is desirable to remove excess heat from the IC.

Regarding claim 5, Hembree does not teach an IC cover, wherein the heat sink portion includes extended surfaces. Takeuchi et al. teaches an IC cover, wherein the heat sink includes extended surfaces. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi et al. into the device taught by Hembree for reasons cited above.

Regarding claim 15, Hembree teaches an IC cover, wherein the spring portion is disposed at an end of the plate portion.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree and Takeuchi et al. as applied to claim 5 above, and further in view of US patent No. 6,349,032 to Chan et al.

Hembree and Takeuchi do not teach a device, wherein the heat sink portion includes fins. Chan et al. teaches an IC, wherein the heat sink portion includes fins (Fig. 1 (14)). It would have been obvious to one of ordinary skill in the art to incorporate the heat sink with fins into the device taught by Hembree and Takeuchi since it is a well known heat sink structure and it is desirable to provide a means for efficient removal of excess heat from the IC.

Art Unit: 2811

8. Claims 22 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of Chan et al.

Hembree does not teach an IC cover including a heat sink with extended surfaces comprising fins. Chan et al. teaches an IC including a heat sink with extended surfaces comprising fins. It would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Chan et al. into the IC taught by Hembree, since it is desirable to remove excess heat from the IC.

9. Claims 14 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments filed June 30, 2003 have been fully considered but they are not persuasive. The applicant argues that the term "pre-loaded shape" is defined in lines 17 – 23 of page 20 and can be readily understood to mean "in a relaxed state". Although, the term "in a relaxed state" is found in the cited text with reference to the plate portion, there is no reason to interpret this to mean "pre-loaded shape". Indeed, the term "pre-loaded" seems to be contrary to the term "in a relaxed state", since "loaded" is commonly used to suggest that pressure or weight is applied to a structure. Furthermore, the term only makes sense when used to describe a structure, such as the plate portion. However, the term "pre-loaded" cannot be used to describe a shape. The intended meaning cannot be ascertained.

Art Unit: 2811

11. The Applicant argues that Hembree does not teach a plate and an attachment portion. The plate (20) is shown in Fig. 1. With respect to the attachment portion, which is understood to mean a portion that something is attached to, there is an attachment portion on the top of the plate since the spring (22) is attached to the top. Additionally, the cover (24), although used as a cover is also in the shape of a plate and may be referred to as such. The clips (26) perform the function of springs and are attached to the plate (24) and an attachment portion directly under the springs (26).

12. The Applicant argues that Hembree does not teach a plurality of individual spring elements. As stated above, the clips (26) serve the same function as a spring.

Merriam-Webster's Collegiate Dictionary (tenth edition) describes a spring as "an elastic body or device that recovers its original shape when released after being distorted".

Hembree teaches disposing springs (26) at a first end and second end of the plate portion around a perimeter thereof. This can be seen in Fig. 2.

13. The Applicant argues, with respect to claim 31, that Hembree does not teach an attachment portion attached to the circuit board and a spring portion coupled to the plate portion and attachment portion. As explained above, the portion of the pressure plate with the spring attached is considered an attachment portion, since it is the portion having something attached. Similarly, in Fig. 2, the attachment portion is located on the die (or the pressure plate), which is in turn directly attached to the circuit board (16).

There is nothing in the claims requiring the attachment portion to be directly attached to the circuit board. While Hembree teaches intervening structures between the attachment portion and the circuit board, it is nonetheless attached to the circuit board.

14. The Applicant argues that Hembree does not teach a plurality of spring portions coupled to the plate portion, with respect to claim 36. There is nothing in the claim requiring a plurality of springs, only a plurality of spring portions. The spring (22) taught by Hembree has a plurality of spring portions that can be taken from any arbitrary location on the spring. The Applicant further argues that Hembree does not teach a plurality of attachment portions. There is nothing in the claim requiring a plurality of attachments, only attachment portions. Hembree teaches an attachment portion that can be taken as several attachment portions by dividing it up.

15. The Applicant argues that Hembree does not teach anything related to center lines, non-radial or a centroid. Hembree teaches an object that would inherently have a centroid or center of mass, as any mass would. Although the precise location of the center line of spring portions is not identified by Hembree, it can be approximated and taken from any location and extending in several directions since there is nothing in the claim limiting where the center line is taken from.

16. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

17. The Applicant argues, with respect to claim 3, that Takeuchi et al. teaches away from an IC cover having a thermal conductivity of at least 10 watts/meter Kelvin because Takeuchi et al. teaches a separate slug. Takeuchi et al. is relied on for the

Art Unit: 2811

teaching that it is desirable to remove excess heat from integrated circuits. Molded polymer materials having high thermal conductivity are known in the art. As stated above, it has been held that the selection of a known material based on its suitability for its intended use is sufficient for a *prima facie* obviousness determination.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

9.22.03.